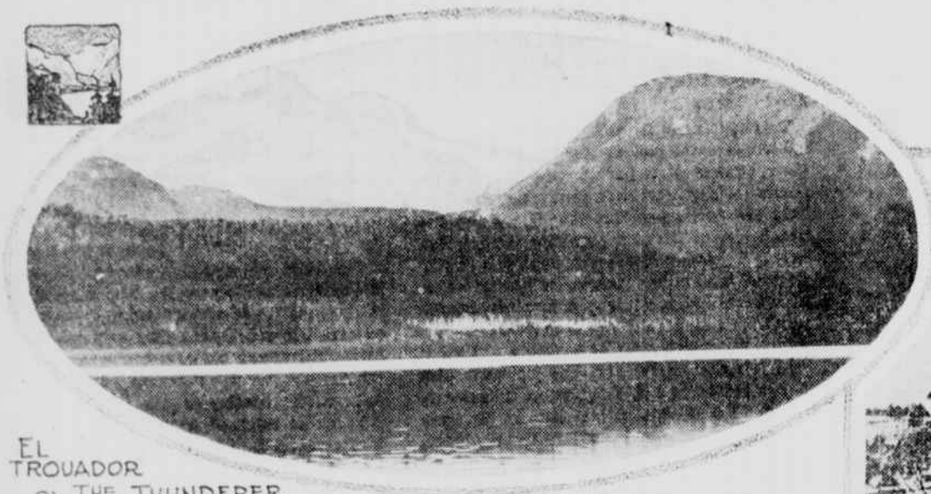
WATER HUNT WHICH WILL MAKE PATAGONIA BLOOM

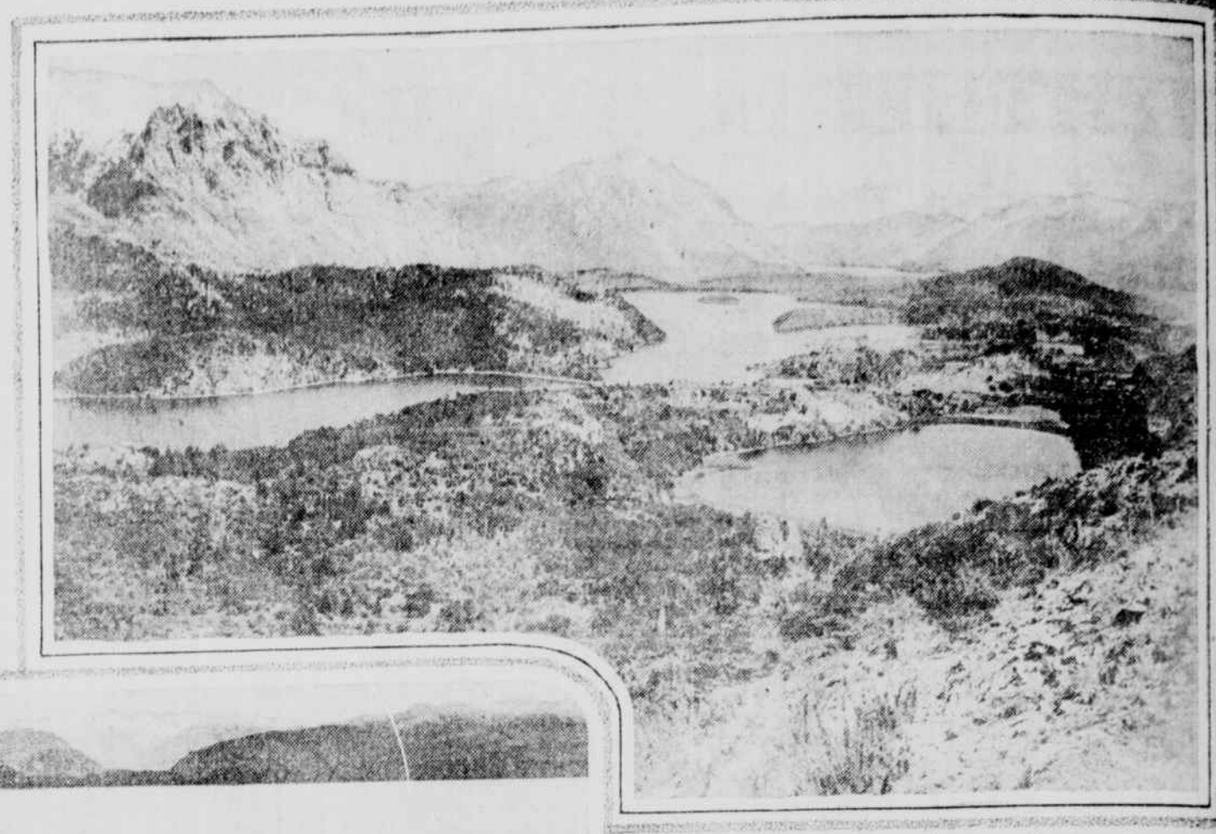
Search of Americans in Arid Mountains for Sources of Power and Fertility Will Result in Reclaiming of a Land.

IT HAPPENED in 1910 that an American geologist in Buenos Ayres, in conversation with the Minister of Public Works, expressed the opinion that a deep well which was being sunk for water in a remote arid district would not be successful. "But I am assured that water will be found at 1,600 feet," said the minister. "I am afraid not," was the answer. "How long were you there?" queried the minister. "Ten minutes, while the train stopped."

The geologist had judged correctly, and it occurred to the minister that his services might be useful in preventing other failures or securing success in drilling on the lines of national railways under construction in the northern and southern territories. Uncle Sam's permission was secured, and the geologist, Bailey Willis, was loaned to the Argentine government.



EL TROUADOR
or THE THUNDERER
ALTITUDE 11,700 FEET. VIEW ACROSS LAGO HESS, ONE OF THE SMALLER LAKES of the ANDEAN LAKE REGION



BRANCHES of LAGO NAHUEL HUAPI, 12 to 18 MILES WEST of BARILOCHE, the FUTURE SUMMER and TOURIST RESORT.

BARILOCHE ON LAGO NAHUEL HUAPI

The work of the United States Geological Survey and Reclamation Service was thus further extended in Argentina. Early in 1911 the corps of topographers and geologists selected by Mr. Willis, a picked group of young men of proved ability, began work on the line of the San Antonio Railway, in Northern Patagonia, primarily to ascertain where and how water might be obtained in that semi-arid region for the port of San Antonio, on the Atlantic, and the railway line under construction, which was to extend to the great Lago Nahuel Huapi, in the Andes, 390 miles away.

SUPPLYING WATER UNDERGROUND FROM THE VALCHETA.

Although underground waters were wanting, the problem was solved by the topographic surveys, which demonstrated the possibility of taking the water of an inland stream, the Valcheta, to San Antonio, by means of a pipe line sixty-five miles long from the required reservoir to the city. After five months' field work the engineering features of the project were fully worked up and a favorable report, submitted to the minister, dispelled a doubt which had existed as to the practicability of developing an important port on the waterless coast.

Up to that time the construction of a transcontinental line, by extending the San Antonio Railway beyond Lago Nahuel Huapi, westward across the Andes to Valdivia, on the Pacific, had been regarded as impracticable, as the southern and western shores of the great lake were known to be very precipitous. But the minister, finding his faith in American ability to overcome difficulties confirmed in the case of the San Antonio water supply, now took new courage. "You will go and find the pass they say does not exist," he said.

The surveys made near San Antonio had been carried out during the dry, moderately cold weather of the Patagonian winter, the men living comfortably in tents. Spring was coming and the treeless brown plateaus were turning green as the corps broke camp, in October, 1911, to ride across to the Andes; but the mountains beyond Lago Nahuel Huapi, on the boundary with Chili, were forbiddingly white with snow, even into January, and those which rose to 8,000 feet or more above sea remained white all summer. Somewhere among them was a deep pass, visited twelve years before by a Chilian engineer, but not known to be accessible from the Argentine side. The task of reaching it was one of exploration in dense forests, oddly enough in this temperate climate obstructed by bamboo thickets that would vie with the tropical jungle. But the way was found and surveys were made which demonstrated the feasibility of constructing a broad gauge freight-carrying railway with a maximum grade of 1.6 per hundred. The existing line between Mendoza and Santiago is a narrow gauge road with 8 per cent grades, and rises to nearly 11,000 feet, whereas the San Antonio-Valdivia line would cross the Andes at less than 4,000 feet above sea.

Prior to the discovery of the relatively easy transcontinental route in Northern Patagonia, where the distance from ocean to ocean, 600 miles, is the shortest practicable for a line across the continent, the minister had been severely criticised for involving the nation in the quixotic scheme of railway construction. He was a minister of rare ability and extraordinary foresight, far beyond the politicians who opposed him. As he found his hopes of future development confirmed by the work of the little corps of surveyors he extended his confidence even more fully to them and supported them with all of his great influence. The scope of their work was enlarged, the corps was increased by bringing experienced specialists from the states, and the work went on, in the winter, in the plateaus between the Atlantic and the Andes, and in the summer in the Cordillera itself.

In Patagonia, stretching from the Atlantic to the Andes, a distance of 400 miles, are vast, treeless, grassy plateaus which vary in altitude from sea level to 4,000 feet above it. Water is scarce and the sheep industry is and always will be the principal source of wealth. Already the number of sheep in the country tapped by the railroad exceeds 9,000,000, partly owned by English and Argentine ranchers and partly by nomadic squatters. Cattle raising also is a profitable business in the western part of these plateaus, where there is more abundant rainfall. Agriculture, on the other hand, is limited to the narrow valleys where lands may be irrigated, and will aways hold a secondary position.

The work of the survey in this pastoral region was chiefly to make adequate topographic maps showing the distribution of waters and the practicable routes of communication, and to study the condition of future development of the grazing industry.

A different series of problems confronted the surveyors when they entered the Andes. The section of that mountain chain which will yield freight to the San Antonio Railway lies between latitudes 39 degrees and 44 degrees south of the equator and has a mountain climate much like that of the Coast Range, in Oregon. It is a region of beautiful lakes and valleys, forest-clad mountains and alpine meadows, surmounted by snow peaks. Resembling Switzerland in scenery, it is also like it in extent and resources. The valley lands are rich and the rain abundant, but farming is limited by the frequent occurence of frosts, except in favored situations. The rich grasses and bamboo afford fodder for raising high grade cattle, and the country is peculiarly adapted to dairying.

Switzerland has a population of 3,700,000, largely supported by manufacturing industries. In the Andes there are but 5,000, living chiefly by grazing cattle. But what of the future?

The streams in this section of the Andes have about 6,000,000 horsepower, of which one-third may be made available. This force is very favorably conditioned for utilization, as the numerous lakes make it possible to store the flood waters, and the falls are concentrated in the mountain district. Considering the general lack of power in Argentina, it is evident that the Andes of Patagonia will become the seat of manufacture of the raw materials of the adjacent country, of woollens, leather, furniture, wood products, chemicals and atmospheric nitrogen; and in so becoming their population will increase until it may approach that of Switzerland.

Early in the course of the surveys, in 1912, the minister, Ramos-Mexia, gave orders to select the site of a central industrial city, which must be situated on the San Antonio Railway, on or near Lago Nahuel Huapi, and in a location appropriately conditioned for the prosperous development of the manufacturing which would be seated there. An ideal situation was found in the valley of the Rio Limay, just below where it leaves Lago Nahuel Huapi, at the focal point of transportation where the transcontinental railroad must be crossed by the north and south line skirting the eastern base of the Andes. The River Limay, a large, clear, swift-flowing stream, may be dammed in a canyon ten miles below the city and be made to yield 60,000 available horsepower. The dam will create a new lake ten miles long, at the level of Lago Nahuel Huapi, and between the two the city will lie like a new Interlaken at the entrance to this southern Switzerland.

The work of the American surveyors in Northern Patagonia had begun in 1911 with studies of geology and underground waters on the Atlantic Coast. Transferred during the summer seasons from November to April to the Andes, or moved during the winter back to the drier districts of the pampas, it had gone on continuously up to May, 1913, with ceaseless activity. None of the men had left the field except when it was necessary for office work, and some of them had lived for two years and a half in tents. The survey had become an effective organization, moving its own supplies by wagon trains to distances of three hundred miles from the railroad, maintaining postal communications by its own mounted messengers, and carrying out thoroughly co-ordinated and efficient work in many widely separated camps. Each topographer, geologist or specialist had his own outfit, with from three to seven Argentine peons, men of the plains, who proved thoroughly effective and loyal when judiciously handled, and from twenty to thirty horses or mules, with pack saddles or wagons, as circumstances required.

Beside the director, Mr. Bailey Willis, there were five American members who were with the work from 1911 to 1913. They were J. R. Pemberton, of Stanford University, and C. W. Washburne, of Oregon, both geologists; Wellington D. Jones, of the University of Chicago, economic geographer; C. L. Nelson and W. B. Lewis, of the United States Geological Survey, topographers. Five other Americans joined the work in the course of its execution—D. L. Raeburn, formerly engineer on the construction of the Los Angeles aqueduct and now engaged in railway location in Alaska on the government railroads, and J. R. Morgan, his intimate associate; C. F. Eberly and O. G. Taylor, topographers of the United States Geological Survey, and R. M. Hatch, expert accountant of the University of Wisconsin. Throughout the country in which they worked these men have made a record for good fellowship and efficiency that does credit to the American name. In physical endurance, activity and hardihood they were the equals of the best, and in their relations with the natives, whether estancieros or peons, they won an enviable reputation for fairness, consideration and gentlemanly qualities.

Associated with the Americans in a position of authority as the assistant director of the survey was an Argentine engineer, Don Emilio E. Frey, and to him, as they one and all recognize, was due in large measure the harmony and success of the work.

The other members of the survey, occupying subordinate positions, were of various nationalities. In many of the camps the language was English for breakfast and Spanish for dinner, and not infrequently French, German, Italian or Danish might be heard among the members.

The year 1913 brought economic difficulties and a crisis in the ministry of Ramos-Mexia. In July he resigned. Retrenchment was necessary, and in obedience to that necessity the active field work of the survey was discontinued. All of the contracts with the Americans were punctiliously fulfilled by the Argentine government, but at their expiration the men were released and sent home, with the exception of Mr. Willis, who was authorized to prepare and to publish in the United States the volumes of reports which should record the work of the survey.

At the close of 1913 Mr. Willis returned to Argentina, and in view of the importance of the industrial projects which the study of the survey's work had disclosed he was authorized to spend the summer months of 1914 in further surveys in the Andes. The surveying corps was reorganized and detailed work was carried out for specific objects.

To these utilitarian problems was added another of equal economic and also of the highest æsthetic importance. The majestic scenery which surrounds Lago Nahuel Huapi, whose western arms extend like deep fiords into the heart of the Andes and lie unfathomable beneath granite cliffs 4,000 feet in height, had impressed upon Moreno, one of the first of modern explorers to visit the lake, the idea that here was the appropriate site for a great national park.

The Americans, who knew our parks at home and had even had a hand in helping to establish them, were roused to enthusiasm to support Moreno's idea. Enlightened Argentines, such as Dr. Ramos-Mexia and Dr. Ruiz-Moreno, the Director General of National Territories, entered vigorously into the campaign. Articles and photographs were published by the leading newspapers of Buenos Ayres, and a sentiment was developed in favor of the park that is sufficient to assure the passage of the law creating it which is now in the hands of the administration.

The reports of the work done by the American surveyors are to be carried to completion, and will eventually be published as a sequel to the volume which is already on the press.

CAPTIVE OFFICER ASSAILS GERMAN STAFF'S PLANS

Versailles, Oct. 25.

DEAR Uncle:—One can easily account for your dissatisfaction with my "field" post cards. They had to be dated merely "At the front," or "In the enemy's country" and to be without details of location or afford any information except such as personal interest, health, and so forth—no account of what has been done, was doing, or expected to be done. Letters had to be in unsealed envelopes, and were subject to severe censorship. All that is changed now—your displeasure may be at an end—or may give place to one infinitely greater. From the postmark you will have seen I am in France. I have been in Paris, and am now—probably not for long—in beautiful Versailles—a prisoner convalescent. Plenty of leisure now, under no restraint from general orders—free on parole—a little money providing many comforts from which we long were estranged—fairly well in health—almost fully recovered from a slight wound—this is the news a dare-devil nephew sends his faraway uncle. The dream of glory, promotion, Iron Cross—all very fine, and in the distance far. At least there are at my disposal a quire of writing paper and a bottle of ink, of which your curiosity shall obtain the full benefit to make up for lost opportunities.

After our venturesome advance into France—for the next day the view of the Eiffel Tower had been promised us—the fatal discovery was made that our rear had remained open to attack; we might be cut off from our base—cut up entirely; our retreat certainly showed a master's leadership. My company, the horses and the three machine guns (somewhat the worse for the excursion) came back to the neighborhood of Brussels, and got a few days of much needed rest. Then our corps occupied Mechlin, close to the outer forts of Antwerp. It was near the end of September; the report spread about that Antwerp is impregnable; can defend herself for twelve months against a besieging army of 300,000. Reports did not frighten us. Our artillery, the heavy siege mortars, did fine work. In that chain of forts one link after the other was forced, the gaps gallantly secured by infantry advances. Thence we turned westward to Termonde, which afforded some severe work until subdued, finally yielding us a safe position on the banks of the River Scheldt, some thirty miles above Antwerp.

Among the officers the phases of enceinte and investment of Antwerp were uppermost in discussion. We heard a fleet of English transports were ready to embark 100,000 men of the garrison, with government and King, at a moment's notice, but would have to steam up toward Termonde, as below Antwerp extend impracticable swamps, all the way to the Dutch frontier. With the passage on the Scheldt safely blocked below, and all surounding territory strongly held, there remained for the interned Belgians no possibility of escape. Either to offer us battle, or cross over into Holland: they had the choice. Both equally favorable to us. We had full confidence in the appreciation of these contingencies by our General Staff, with proper action and strategic preparation to meet them.

We, at Termonde, were to force an engagement, and throw the fugitives back to Antwerp, in case they approached us. Remember, be it far from me to criticise orders, or superior officers. At the time, beginning of October, this was our talk.

On October 10 we heard of Antwerp's fall. Our troops had after a siege of somewhat less than two weeks, reduced the double chain of forts, and entered a city deserted, evacuated. There had been one loophole left through which King, government, some 60,000 soldiers, had been able to make good their escape. One loophole, with consequences to us of utmost seriousness.

Here I must jump in my tale, and bring some pointed remarks made by a fellow prisoner of mine, an officer of high rank in the army, lying in the cot next to mine. Of course, I cannot give his name. His criticism covers two grave mistakes to be charged to the General Staff: First, the overspeedy advance by our right wing, throwing it out of line, leaving its rear open to attack by the Belgians who still could assemble considerable strength. At best, the right should have coincided with an advance by our left. This junction effected, then gave (would have given) a twofold opportunity, either to attack Paris or to encompass the French field armies, hurl them upon themselves in the centre—achieve another Sedan. Second, the escape from Antwerp should have been rendered impossible by the disposition of superior forces all around, previous to the assault on the inner fortifications. The Belgians would then have been caught in a trap, done away with for good. Troops, government and King in our power, prisoners. A formidable factor, that has since told against us and is still telling, would have been definitely disposed of; their heroic resistance, so useless, to us so annoying, ended.

Here I am at the seventh page of my letter, and have as yet not arrived at the tale of my being taken prisoner. Must defer it for another day. . . .

ON TO GHENT—THE SURPRISES OF WAR.

Versailles, Oct. 29.

. . . To resume the narrative. On October 11 we again were on the move, under orders to pursue with utmost speed the enemy fleeing toward the west. On to Ghent! Some regiments first to proceed to Lokeren, a few miles north, then push on westward. Push on! Ahead! We did push on, my men are off, riding like wind clouds, the three machine guns with us. May follow who can, we are pushing on fast, and soon came on marks and traces of fresh tracks. It was a fairly wide road, somewhat cut up, which appeared to lead straight on, ditches each side, hedges and bushes about 500 yards away. Suddenly the road led into a depression and was covered with water, to a depth, I estimated, of a foot. Recent heavy rains—no matter—on, forward! We shall soon have a word or two to say to our Belgian hosts. Straight on, fast we came along, when horses and wheels sank into mud. The riders behind swerved off to the left, same fate—we were off the road—when from the bushes I had thought 500 yards away—they had come to half the distance—a galling rifle fire opened upon us—bullets from all around. Indeed we had come up to the Belgian rear guard—and they had come upon us.

Men, surprised, fall all around, my horse was hit, rolled into the mud; I, just in time to jump, feel a tickle in the calf of the left leg, but am able to stand, in water up to the hip. Taking in our position, entirely hopeless—either be annihilated in a few minutes—no rescue from behind was within sight—I tied the handkerchief to the point of my sword and raised it. There were but fifty men to surrender, to hundreds that emerged from bushes and ditches.

The wound, attended to with an emergency bandage, was of no account; the Belgian surgeon had, nevertheless, taken us to the ambulance wagon; he told me the road, where we drove straight on, made a curve to the right, hidden to the pursuers by the inundation.

For the time being, goodby ambition—it cannot be helped. We were brought to Ghent. Thence into France, passing villages and towns we had not so long since seen as advancing conquerors, then retreating, now re-seen as prisoners of war. We came to Paris, not exactly as we had expected to come. Sent to Versailles with hundreds of wounded, convalescents, our treatment has been satisfactory. To me the one surprise was the great, great number of prisoners held—everywhere there are detention camps; everywhere hospital camps—wounded of both sides—beyond any estimate. Enough to dampen the enthusiasm for glory!

As to myself, I got along, speaking French. From what I can gather, complaints are perhaps justified in isolated cases, and this often the fault of the complainant. From personal observation, a real grievance may lie against the detail of guards from over the sea. When an Algerian Turco or a Senegal negro hears of warfare it implies personal enmity. A prisoner to him means a foe that has to be whipped into submission, on whom he is free to visit any brutality—and deserve praise for it. The African also remembers the superiority the white man generally assumes over him—at best the African is held somewhat better than cattle—so he cannot forego the opportunity to retaliate to show and make felt his temporary authority.

The General Staff's plans were at fault. Another officer gave it as his opinion that a complete subjugation of Belgium should have preceded the forward movement into France. Such an enemy, animated by the feeling of injury, of violation of his neutrality, in the desperate struggle for his existence, deserves not to be underestimated. The same as the all too hasty advances, by Germany and Austria both, followed by disastrous retreats hardly stand to the Supreme War Board's credit.

Little Stories of Field and Bivouac

At the foot of the hill of Jouarre, near La Ferté, is a simple wooden cross bearing the inscription "T. Campbell, Seaforths." It marks the grave of a brave Highlander who, even after receiving a mortal wound, accounted for three of the enemy. Campbell was with a small detachment of Highlanders who encountered a score of "Death's Head" Hussars, and somehow became separated from the others. Nothing daunted, however, he dashed alone into the middle of the Germans, who fired a volley at him. Mortally wounded, he still managed to kill one hussar and wound two others before he was finally dispatched by the enemy.

There is a humorous element in the story of how a couple of German spies were trapped at Soissons. It is a favorite trick of the Germans to dress up as women, and, speaking French, get into the British lines. Two of these, who had been overheard asking some of our soldiers in English what they got to eat, aroused the suspicions of a sergeant. "I nipped across quick to say something to one of our officers," he says. "He heard, came across behind the two peasant women, got one neck in each hand and just whacked their heads together before they knew it. He pretty well stunned them, and then we had 'em into brigade headquarters. They turned out to be two German men, and I think it was a bullet for each soon afterward."

Because they did not wish the Germans to wreak their vengeance on the house and the village which had sheltered them, two troopers of the Irish Dragoons sacrificed their lives in the most heroic circumstances. One of them had carried his chum, who was slightly wounded, to a farmhouse under fire, and when the retreat came got left behind. Suddenly a German patrol appeared. There were only the two—one wounded—against a dozen Uhlans, but behind a barrier of furniture the two Irishmen kept the Germans at bay, wounding or killing half of them. The Germans then made off and brought a machine gun to the house and threatened to destroy it. The two soldiers, not unmindful of the kindness shown them by the owners of the farm, and rather than bring loss on them or the village, made a rush out with some mad idea of taking the gun. But in vain. Just over the threshold of the door they fell dead.—Tit-Bits.